

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

A403347401

FACILITY: The Dow Chemical Company U.S.A., Midland	SRN / ID: A4033
LOCATION: 1790 Building, MIDLAND	DISTRICT: Saginaw Bay
CITY: MIDLAND	COUNTY: MIDLAND
CONTACT: FRED MCNETT , Responsible Care Leader	ACTIVITY DATE: 12/20/2018
STAFF: Kathy Brewer	COMPLIANCE STATUS: Compliance
	SOURCE CLASS: MEGASITE
SUBJECT: Trinseo portion of FCE for A4033; MI-ROP-A4033-2017b Section 2. EU31-S2, EU33-S2, EUB1-S2, FGSTYRENICSHTRS-S2, FGHONFUGITIVES-S2, FGLATEX-S2, FGPOLYSTYRENE-S2 FGBOILERMACT-S2, FGRULE290-S2, FGCOLDCLEANERS-S2, FGOLDMACT-S2, and FGEMERGENCIRICE-S2. Equipment covered by FGRULE287(c)-S2 and EU34-S2 has been dismantled.	
RESOLVED COMPLAINTS:	

Trinseo A4033 Sec 2 Inspection write up

Trinseo portion of FCE for A4033

The facility contact for the inspection is Fred McNett, Responsible Care Leader, Trinseo.

Others participating at various times throughout the inspection included Tony Rocha, Melissa Zanke-Detwiller and Jos van den Brink

Trinseo is Section 2 of the MI-ROP-A4033-2017b. The processes covered in the ROP are subject to the requirements of 40 CFR Part 63, Subparts A and U, and the equipment leak provisions of Subpart H, Subpart JJJ, Subpart EEEE, Subpart ZZZZ, and Subpart DDDDD. The site was subject to the requirements of EPA Consent Decree No. 1:11-cv-13330-TLL-CEB until it's termination on February 27, 2017.

In 2017 EU34-S2 was issued PTI # 33-16 for a fiberglass composite pellet line but the unit has since been demolished. The equipment covered by FGRULE287(c)-S2 has also been demolished.

The Trinseo Midland Michigan site does not have any processes subject to the 40 CFR Part 63 Subpart Q or Part 61 Subpart FF requirements contained in the ROP Part B Source Wide Requirements. The site has one process covered by the Rule 290 permitting exemption.

During the inspection we reviewed the plastic and latex processes and associated emission control devices, monitoring, and ROP required records.

All areas evaluated indicate the facility is in compliance with the requirements of MI-ROP-A4033-2017b.

While on site I reviewed historical and instantaneous operating parameters required to be monitored by the ROP. Walkthrough included viewing control devices and the associated metering and operating control equipment.

ATTACHMENTS:

Preventative Maintenance/calibration records

- Flow meter to EU31-S2 Styrene Scrubber
- EU31-S2 and EU32-S2 furnace temperature meter calibrations
- EUB1-S2 TOX temperature meter

Safety Data sheet for Methacrylamide

Current list of the materials used in EU31-S2 and EU33-S2 that are determined to be exempt from the health-based screening level requirements of R 336.1225

FGEMERGCIRICE-S2 engines maintenance check operating hours Dec. 2016 – Sept. 2018

Operations record example from Dec., 2017; May, 2018, Aug., 2018, and Dec., 2018

- EU31-S2 Water scrubber flow, styrene scrubber liquid flow and temperature
- EU33-S2 Furnace Temperatures
- EUB1-S2 Operating Temperature for process heaters Operating Temperature for EUB1-S2 TOX
- FGSTRENICSHTR-S2 Temperature

Example Calculation basis May 2018 EU31-S2

12 Month Rolling Emissions Dec., 2017; May, 2018, and Aug., 2018

EU31-S2

EU33-S2

Rule 290 documentation for B1053 Burn off oven

R290 12 month and November 2018 emission calculations

FGEMERGCIRICE-S2 engines maintenance check operating hours Dec. 2016 – Sept. 2018

Sep. and Aug. 2017 Release Reports

EU33-S2 block flow diagrams for process heater and VOC sources

FILES REVIEWED

Business confidential process flow diagrams

MAERS 2017 submittal

40 CFR Part 63 Subpart H, U, and JJJ Semi annual reports September 2016 through September 2018

ROP Semi Annual Deviation Reports September 2016 through September 2018

Release Reports September 2017 – November 2018

2011 EU33-S2 Stack test

EU31-S2: Compliant

The mass ABS process in the low gloss ABS manufacturing plant with reactors, separators, storage tanks/silos and related equipment. Air emissions from the styrene absorber are typically vented to the combustion air intake of two process heaters (FGSTYRENICSHTRS-S2) unless the vent header collection system is shutdown for maintenance. The vent header collection system is located between the absorber and the combustion air intake of the heaters. In the event the vent header system is shutdown, process exhaust from the styrene scrubber discharges to the air through vent #SVEG31001.

Under normal operating conditions, inlet vapors to the packed column scrubber will be added to the combustion air intake of one of the two natural gas fired process heaters (FGSTYRENICSHTRS-S2). In the event the vent header collection system to the process heaters is shutdown for maintenance, air emissions from the process will be exhausted to the packed column water scrubber and discharged through Vent No. SVEG31002. There are pressure safety devices that vent to a “scavenger tank”.

The Styrene Absorber is a recovery device and is also used to control emissions from a regulated surge control vessel subject to 40 CFR Part 63, Subpart JJJ. The required removal efficiency is met with the Styrene Absorber independent of the process heaters. The process heaters are not required control for achieving compliance with the Polymer & Resins IV MACT standard.

The emission unit is subject to 40 CFR Part 63 Subparts A, H, and JJJ. The process heaters are subject to 40 CFR Part 63 Subpart DDDDD but do not burn any Solid Waste so are not subject to 40 CFR Part 60 Subpart CCCC (CISWI)

This emission unit was permitted in PTI 349-90B, issued in 1993 and rolled into the ROP in 1997.

Emission limits

I reviewed example calculations for December 2017, May 2018, and August 2018. The emissions are based on calculated emissions from various production activities. For emissions to the process heaters the hours that the operation is venting to the process heaters and a 99.9% destruction rate are included in the calculations. For any emissions from the styrene scrubber, no destruction is assumed. For May 2018, a detailed emission by activity report is attached. The files reviewed indicate the facility is in compliance with permitted emission limits. The 12 month rolling emissions for Dec 2017, May 2018 and August 2018 are summarized below.

Date	Styrene (limit 8.8 TPY)	Acrylonitrile (limit 0.06 TPY)	VOC (10 TPY)
12/2017	0.62	0.01	0.63

5/2018	0.64	0.01	0.64
8/2018	0.62	0.01	0.62

For the EU31-S2 process heaters the emission calculation assumptions were last reviewed and updated in April 2007. The Grinder emissions are based on July 1996 calculations. Trinseo staff believe this is acceptable as the process has changed very little if at all since 2007. I recommended that they establish a review cycle for emission calculations on a more frequent basis than once per 10 years.

There are no *Material Limits* in the ROP.

Process/Operational restrictions

SC 5 requires the average liquid flow rate of the water scrubber to be ≥ 15 gpm.

SC 6 requires the average liquid flow rate of the styrene scrubber to be ≥ 0.5 gpm.

SC 7 requires the average inlet line temperature to the styrene scrubber to be ≤ 15 C.

SC 8 allows up to 360 hours of process heater bypassing (FGSTYRENICHTRS-S2) if emissions are vented to the water scrubber or styrene scrubber prior to discharge to the atmosphere.

SC 9 requires carbon bed change out activities be initiated at 75% and prior to 90% of the carbon bed load capacity.

Design/Equipment parameters

SC 1 requires the water scrubber to be equipped with a maintained liquid flow indicator

SC 3 requires the styrene scrubber to be equipped with a maintained liquid flow indicator and temperature indicator for the chilled styrene inlet.

Monitoring/Recordkeeping

SC 1 and 3 require continuous monitoring and records of the liquid flow rate of the water scrubber

SC 2 and 4 require continuous monitoring and records of the liquid flow rate and the inlet liquid temperature of the styrene scrubber.

The site monitors lb/hr styrene. There are approximately 7.52 lbs styrene in one gallon. I estimated that is equivalent to 225.6 lbs/hr

Review of facility records and on-site observations indicate the facility is in compliance with the Process/Operational restrictions, Design/Equipment parameters, and Monitoring/Record keeping requirements.

Date (single short term averages at time in parenthesis)	Water scrubber flow (limit ≤ 15 gpm)	Short Term Water scrubber flow (limit ≤ 15 gpm)	Short term Styrene scrubber flow (limit ≥ 0.5 gpm {~225.6 lbs/hr})	Daily Styrene scrubber flow (limit ≥ 0.5 gpm {~225.6 lbs/hr})	Short term Styrene inlet temperature (limit ≤ 15 C)	Styrene scrubber inlet temperature (limit ≤ 15 C)
12/10/2017 (11:30 AM)	<22; >18 gpm	20.05 gpm	403.5 lb/hr	>330;<500 lb/hr	0.8 C	<7; >-2 C
5/10/2018 (7:00 AM)	<22; >15 gpm	16.85 gpm	498 lb/hr	>475;<550 lb/hr	4.9 C	<7; >2 C
8/10/2018 (21:00 PM)	<22; >18 gpm	20.02 gpm	506.6 lb/hr	>475;<550 lb/hr	4.9 C	<6; >3 C
12/20/2018 During inspection	NA	20 gpm (~75% of 25 gpm meter readout)	498 lb/hr meter reading (~>1 gpm)	NA	4.7 C	NA

SC 5 requires the permittee to maintain a current list of the materials used in EU32-S2 that are determined to be exempt from the health based screening level requirements of R336.1225. Trinseo's current list is :

Acrylonitrile, Styrene, Ethylbenzene, n-dodecyl mercaptan, Xylene, isopropyl benzene, and cyclohexanone

SC 8 requires the permittee to keep records of the carbon bed load capacity calculation and resulting change-outs.

The permittee performs carbon change out based on a correlation to a subset of production activities that vent to the carbon. The last carbon change occurred on March 3, 2018

There are no *Testing/Sampling requirements* in the ROP.

Stack/Vents

The information on the stacks listed in the table below was verified during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SVEG31001	2 ¹	81 ¹	Styrene Scrubber; Mostly A Train
2. SVEG31002	2 ¹	81 ¹	Water Scrubber; Mostly B Train
3. SVEG31003-Eliminated 4/2017	1.5 ¹	38 ¹	Standpipe
4. SVEG31004	22.5 ¹	24 ¹	Slurry Tank
5. SVEG31010*	4 ¹	8 ¹	Carbon Bed
6. SVEG31024	14 ¹	70 ¹	Boiler/furnace vent
7. SVEG31025	14 ¹	70 ¹	Boiler/furnace vent
8. SVEG31012 (Vent No. 658-3. This vent is associated with a styrene tank that used to be affiliated with EU38.)**	4 ²	15 ²	
9. SVEG31024	14 ¹	70 ¹	Mercaptan Storage Tank

OTHER REQUIREMENTS

The requirement to comply with EPA Consent Decree No. 1:11-cv-13330-TLL-CEB for all equipment regulated under LDAR is no longer applicable. The Consent Decree was terminated on February 27, 2017.

EU33-S2: Compliant

A styrene copolymer facility that is a continuous copolymer manufacturing operation.

The emission unit is subject to 40 CFR Part 63, Subparts A, H (equipment leak provisions of the HON), JJJ (Group IV Polymers and Resins). On the compliance date of the rule, the process heaters will be subject to 40 CFR Part 63, Subpart DDDDD (Industrial, Commercial and Institutional Boilers and Process Heaters – Major Sources).

This emission unit was permitted in PTI 72-08A.issued in April 2011 and rolled into the ROP.

The process to make styrene copolymer involves raw material handling, reaction and devolatilization, finishing and process heaters. Raw materials are fed directly to the reactor train. Emissions from these operations are either sent to the process heaters, vapor balanced between tanks, or to an atmospheric vent. Vapors removed from the reaction train pass through condensers to recover condensables. Uncondensed vapors (mostly nitrogen with some monomers, styrene compounds, polymerization by-products, and additives are vented to the process heaters. Vapors from monomer recycle tanks vent to the process heaters. The process heaters provide heat for process heat transfer fluids. The two 7 MMBTU/hr process heaters operate in parallel and are designed to incinerate the process vent gases and heavy recycle streams from EU33-S2. Typically, the plant will only operate one process heater at a time while the other heater is kept warm and ready for use if needed. The process heaters are not required control for achieving compliance with the Polymer & Resins IV MACT standard.

Emission Limits

I reviewed example calculations for December 2017, May 2018, and August 2018. The emissions are based on calculated emissions from various production activities. The files reviewed indicate the facility is in compliance with permitted emission limits. The 12 month rolling emissions for Dec 2017, May 2018 and August 2018 are summarized below.

Date	Styrene (limit 1.0 TPY)
12/2017	0.030
5/2018	0.038
8/2018	0.037

There are no *Material Limits* in the ROP.

Process/Operational restrictions

SC 1 limits the hours EU33-S2 may operate while bypassing the process heaters due to a process heater malfunction to 864 per year.

SC 2 limits the hours EU33-S2 may operate while bypassing the process heaters due to process heater startup/shutdown conditions to 4380 per year.

The process furnace temperature and operating status is continuously tracked and downtime is tracked in a database. The process shuts down 2-3 times each year related to inventory demand or cleaning. Therefore the SSM possible bypass time is limited to less than a few weeks each year.

Design/Equipment parameters

SC 1 requires the process heaters to maintain a minimum batch cycle daily average fire box temperature of 550 degrees Celsius.

Monitoring/Recordkeeping

SC 1 and 2 require continuous monitoring and records of the fire box temperatures when EU33-S2 is venting to the process heaters.

Review of facility records and on-site observations indicate the facility is in compliance with the Process/Operational restrictions, Design/Equipment parameters, and Monitoring/Record keeping requirements.

Date	Furnace Temperature range (degrees Celsius)	Temperature requirement from SC IV.1. (>550 C)	Comment
12/4-11/2017	0; <700	Compliant	The attached graph of process furnace temperatures for December 3 – December 12, 2017 show the monitoring of the furnace during shutdown
5/7-14/2018	>600; <700	Compliant	
8/6-13/2018	>600;<700	Compliant	
12/20/2018	670 (instantaneous)	Compliant	Operators screen

SC-3 requires the permittee to maintain a current list of the materials used in EU32-S2 that are determined to be exempt from the health based screening level requirements of R336.1225. Trinseo's current list is :

Acrylonitrile, Styrene, Ethylbenzene, n-dodecyl mercaptan, Xylene, isopropyl benzene, and cyclohexanone

There are no *Testing/Sampling requirements* in the ROP. In 2011 the facility conducted a stack test on a process heater to demonstrate compliance with the emission limits while operating at a minimum of 550 C.

Stack/Vents

The information on the stacks listed in the table below was verified during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SVEG33004	4 ¹	50 ^{1,2}	Vent Bypass
2. SVEG33005	19 ¹	59 ¹	Process heater
3. SVEG33006	19 ¹	59 ¹	Process heater

EUB1-S2

The S/B Latex facility consists of raw material unloading and storage, polymerization of raw materials, recycle of unreacted components, final product storage and loading of latex to containers for shipping. The emission unit vents to the 963THROX-S1 with a backup afterburner (TOX). The process utilizes a vapor balance system for truck and rail material handling. Most of the vapor balance are closed loop with 3 having the option to vent to the 963THROX-S1 or TOX.

This emission unit is subject to the requirements of 40 CFR Part 63, Subparts A, U, and equipment leak provisions of Subpart H. The process also has emergency generators subject to the RICE MACT ZZZZ

In 2008 this emission unit was permitted in 49-07A and rolled into the current ROP in 2011.

The following emission limits apply to the indicated vents.

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Additives (non-carcinogenic air contaminants with ITSL ≥ 2ug/m3)*	5.2 pph ¹	Test method	EUB1-S2 (Vent 30)	SC VI.2	R 336.1225
2. Additives (non-carcinogenic air contaminants with ITSL≥2ug/m3)*	43.3 lbs / year ¹	12-month rolling time period as determined at the end of each calendar month	EUB1-S2 (Vent 30)	SC VI.2	R 336.1225
3. 1,3-Butadiene *	720 lb / year ¹	12-month rolling time period as determined at the end of each calendar month	EUB1-S2 (Vent #17 and Vent #18)	SC VI.2	R 336.1225
4. PM (non-carcinogenic air contaminants with ITSL≥2ug/m3)	0.03 lb / 1000 lbs of exhaust gases ²	Test method	EUB1-S2 from Vent #13	SC VIII.1	R 336.1331
5. PM (non-carcinogenic air contaminants with ITSL≥2ug/m3)	0.08 lb / 1000 lbs of exhaust gases ²	Test method	EUB1-S2 from vent #28	SC VIII.4	R 336.1331
6. PM (non-carcinogenic air contaminants with ITSL≥2ug/m3)	0.07 lb / 1000 lbs of exhaust gases ²	Test method	EUB1-S2 from vent #29	SC VIII.5	R 336.1331

* This limit does not include fugitive emissions from the process

A review of emission calculations for December 2017, May 2018 and August 2018 indicate the facility is in compliance with the permitted emission limits.

Butadiene emission limits are based on flow going to the 963THROX-S1 or the TOX and destruction efficiency. Methanol is the only TAC with an ITSL >2 ug/m3. The gallons of the process methanol mixture transferred to the 311 storage tank and calculated displacement is used to determine emissions. The methanol mixture has not changed since the estimates used in the calculation were established.

Design/Equipment parameters

SC 1 requires the backup TTU (TOX) to maintain a minimum fire box temperature of 800 degrees Celsius when accepting process vents.

Monitoring/Recordkeeping

SC 1 requires continuous monitoring and records of the fire box temperatures for the backup TTU (TOX).

Review of facility records and on-site observations indicate the facility is in compliance with the Process/Operational restrictions, Design/Equipment parameters, and Monitoring/Record keeping requirements.

Date	Furnace Temperature range (degrees Celsius)	Temperature requirement from SC IV.1. (>550 C)	Comment
12/10/2017	>790; <870	Compliant	Two temperature monitors on TOX
5/10/2018	>770; <930	Compliant	Two temperature monitors on TOX
8/6-13/2018	>770;<930	Compliant	Two temperature monitors on TOX
12/19/2018	793 (instantaneous)	Compliant	Operators screen

The process has a large surge tank after the styrene scrubber exhaust hold tank which reduces the frequency that TOX is used. The site conducts 1 hour tests on the TOX monthly to assure readiness. Otherwise the TOX is only used a few times each year when the 936THROX-S1 is unavailable.

The facility monitors the valving for the vents going to 963THROX-S1 and TOX.

Stack/Vents

The information on the stacks listed in the table below was verified during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. Vent #13 (SVB10013)	6 ¹	36 ¹	Methacrylamide mix tank
2. Vent #17 (SV963THROX)	18 ¹	80 ¹	
3. Vent #18 (SVB10018)	30 ¹	40 ¹	TOX
4. Vent #28 (SVB10028)	6 ¹	41 ¹	Raw Material
5. Vent #29 (SVB10029)	4 ¹	55 ¹	Raw Material
6. Vent #30 (SVB10030)	2 ¹	18 ¹	Methanol Storage Tank

FGSTYRENICSHTRS-S2: Compliant

Emission Unit: EU31-S2

<http://intranet.deq.state.mi.us/maces/WebPages/ViewActivityReport.aspx?ActivityID=24695961>

1/9/2019

Two 7 million BTU/hr natural gas and process vent direct-fired process boilers referred to as boiler F-3A east and boiler F-3B west. Boilers also burn process exhaust from emission unit EU31-S2. These boilers are located at 1295 Building.

FGSTYRENICSHTRS-S2 is subject to 40 CFR Part 63, Subparts JJJ and DDDDD. In addition, by virtue of being subject to this regulation, FGSTYRENICSHTRS-S2 is also subject to the equipment leak provisions of the HON (i.e., 40 CFR Part 63, Subpart H).

FGSTYRENICSHTRS-S2 has *no emission or material limits* specified in the ROP.

There are *no Design/Equipment parameters or Testing Sampling requirements* in the ROP.

SC VI. MONITORING/RECORDKEEPING

When not subject to the MACT JJJ requirements, the permittee is required to monitor and record, on a continuous basis, the exit gas temperature of each process boiler. Review of facility records and on-site observations indicate the facility is in compliance with the monitoring and record keeping requirements.

Date	Furnace Temperature range (degrees Celsius)	Temperature requirement from SC III.1 & 2. (>432 C)
12/10/2017	>550; <625	Compliant
5/10/2018	>525; <600	Compliant
8/10/2018	>500;<575	Compliant
12/20/2018	528 (instantaneous)	Compliant

SC III. (1) and (2) PROCESS/OPERATIONAL RESTRICTIONS

When not subject to the MACT JJJ requirements, if the radiant combustion temperature of boilers F-3A or F-3B is less than 432 degrees C, the permittee is required to take corrective action and maintain a record of action taken to prevent a reoccurrence. The permittee is exempt from this requirement for up to 360 hours per year per boiler.

FGHONFUGITIVES-S2: Compliant (EU31-S2, EU33-S2, EUB1-S2)

FGLATEX-S1: Compliant (EUB1-S2, EURULE290-S2)

FGPOLYSTYRENE-S2: Compliant (EU31-S2, EU-33-S2)

Required MACT H, U and JJJ reports and NOCs updates have been received. A review of MACT H, U and JJJ reports found very low % leaks (1.2% or less) or no leaks detected, no delay of repairs for equipment in light liquid service, and no leaks detected during inspections of units subject to process wastewater handling reported. A malfunction report was submitted for a EUB1-S2 associated pressure relief valve in organic HAP service that discharged to the atmosphere during the January – June 2018 reporting period. A process emergency shutdown resulted in the pressure relief safety valve on the first reactor emitting to the atmosphere for one minute. 3 ruptured discs released to the safety vent tank. Emission estimates reported were 8.9 pounds Styrene and 1.3 pounds Ethylbenzene. No VN was sent as reporting and timely corrective action resolved the issue

FGBOILERMACT-S2: Compliant

Emission Units: EU31-S2, EU33-S2, EURULE290-S2

FGR290-S2: Compliant

Per Fred McNett December 19, 2018 correspondence, there is only one process that is claimed as covered by the R290 exemption. That is the Beringer Oven that resides in the 658 building and associated with Styrene Polymers.

Trinseo provided the documentation for the Rule 290 exemption.

Emission records for December 2017 through November 2018 are attached. There were no emissions in November 2018. The rolling 12 month emissions for November 2018 were 0.0796 pounds total.

FGCOLDCLEANERS-S2: Pending

There are three solvent equipment cleaner/wash stations used on site. One is a “flat plate” heated wash station. The heated wash station remains empty until needed for use during process shutdown. The shutdown happens approximately once every three years. Equipment to be washed is placed in the solvent tank, solvent is added, a covered placed on the wash station, and the solvent brought up to 120F for about 30 days. The wash station is then

emptied and not used until the required during a shutdown. Records of the wash station temperature are maintained. Adequate signage was present at the wash station.

I requested that Trinseo verify if the flat plate heater is covered by the FGCOLDCLEANERS-S2 conditions.

FGOLDMACT-S2: Compliant

FGEMERGENCIRIC-S2: Compliant.

SC III.2 limits the limit operation of each stationary emergency RICE for the purposes of maintenance checks and readiness testing up to 100 hours per year with up to 50 hours per year in non-emergency situations.

Engine operating hours for the period of December 2016 through September 2018 were reviewed. Engine #61P00728 was operated for maintenance purposes a total of 32 hours. Engine #4XF00555 was operated for maintenance purposes a total of 41 hours.

FGRULE287(c)-S2: Compliant. No longer applicable emission units at the Trinseo Midland, Michigan facility.

Miscellaneous:

Trinseo staff will be attending a MAERS workshop in early 2019. Once the facility is given it's own SRN, I discussed the need to submit attachments with supporting calculations for any emission basis other than the MAERS default values.

The Appendix 2 Schedule of Compliance language is not correct due to editing errors. The language should reflect that there is no Schedule of Compliance for A4033 Section 2.

NAME 

DATE 1/9/2019

SUPERVISOR C. Howe